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Resource
2 SD11
A42

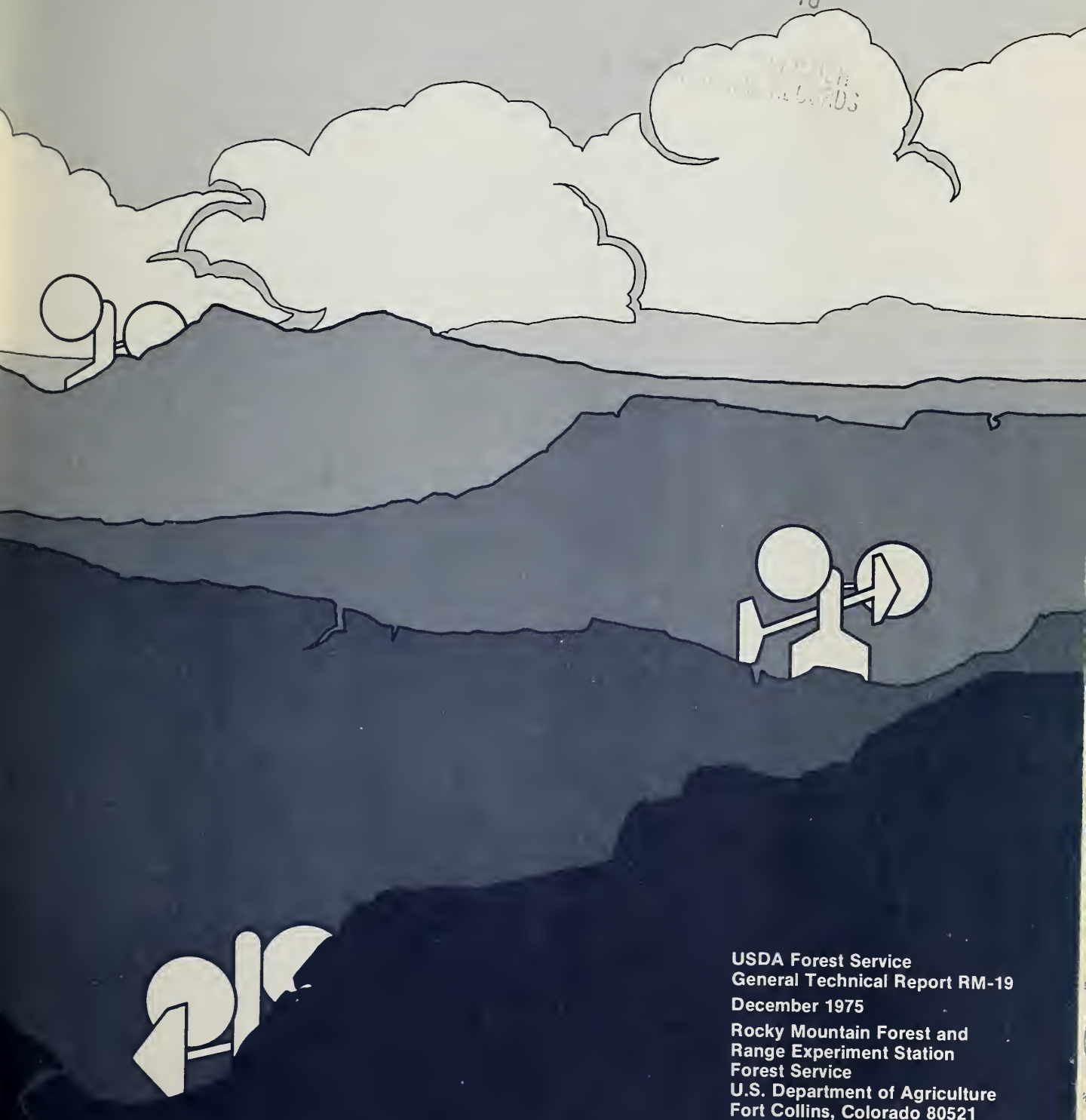
The National Fire Weather Data Library:

What It Is and How to Use It

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NATIONAL FIRE WEATHER DATA LIBRARY

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Abstract

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The National Fire Weather Data Library is a collection of daily weather observations from fire weather stations across the Nation. Current data are accumulated on collection tapes, then merged onto library tapes annually. Example run streams are given for using the library on the UNIVAC 1108 computer at the Fort Collins Computer Center.

Keyword: Fire weather

#2055079

The National Fire Weather Data Library: What It Is and How to Use It

R. William Furman¹ and Glen E. Brink¹

What Is It?

The National Fire Weather Data Library is a collection of computerized historical weather data. The Library was conceived and assembled by the Forest and Mountain Meteorology Staff at the Rocky Mountain Forest and Range Experiment Station. A user-oriented version of the Library is maintained on the USDA UNIVAC 1108 at the Fort Collins, Colorado Computer Center (FCCC), by the National Fire Danger Rating Staff, Northern Forest Fire Laboratory, Missoula, Montana. The Library consists of daily weather observations, usually taken during the fire season, at sites maintained across the entire Nation by fire management agencies for use in their fire suppression planning.

The main source of current data is the fire danger rating program AFFIRMS (Administrative and Forest Fire Information Retrieval and Management System), (Furman and Helfman 1973, Helfman et al. 1975). For some fire weather stations, the length of record exceeds 15 years. The data are from active and inactive fire danger stations.

This pool of weather data is a valuable source of information on the climatology and meteorology of our forested and mountainous regions. It is available to all agencies who have access to the computer at the FCCC. For agencies that do not have access to FCCC, requests for data can be made directly to the authors.

What Is It For?

Data were initially collected by fire managers for input into fire management decisionmaking, because the National Weather Service observing stations were not located where they could monitor weather conditions meaningful to fire danger problems in forested areas. Federal agencies concerned with resource fire protection established their own network of weather observation stations in locations where the fire danger could be more accurately monitored. This fire danger network has grown to more than 800 stations monitoring weather once daily. The observations are taken

during the early afternoon when fire danger is usually the worst. In addition to planning for fire suppression activities, the data have become useful for other planning efforts such as slash disposal, prescribed fire, and environmental impact evaluation.

There is also an important need for a good data base in support of forest meteorology research. The fire danger observations are a source of weather and climate information not available elsewhere. The importance of a forest and mountain climate data base is destined to increase as the management of our natural resources comes under closer public scrutiny.

It is therefore important to have a system designed to facilitate the cataloging and retrieval of the vast quantities of weather data being gathered from all parts of the Nation. The Fire Weather Data Library is such a system.

How Does It Work?

The Fire Weather Data Library was designed to facilitate the cataloging and retrieval of the large quantities of data for research being conducted at the Rocky Mountain Forest and Range Experiment Station in forest and mountain meteorology. The primary source of current data is a tape prepared by AFFIRMS from information gathered via a time-share computer system from participating agencies across the Nation. Each participating unit relays weather information via computer terminal to AFFIRMS where fire danger indexes are computed, and the weather information is stored for future retrieval. Historic data for years past, obtained from a number of sources in many different formats, are included in the Library.

The Library system has two main parts, the 'collection' tape and the 'library' tapes. The collection tape is updated weekly. As data are received at the Rocky Mountain Station from AFFIRMS, or as new historic data are received from other sources, they are sorted and merged onto the collection tape. These data are available for anyone having a need of current-year data. In January of each year the collection tape is merged onto the library tapes and a new collection tape is started. The library tape is the repository for all but the current year's data and

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Table 1. FIRE WEATHER DATA - CARD EDITING AS OF NOVEMBER 1, 1975

Item	Column	Minimum Value	Maximum Value	Error	Action taken with notification ¹
Station Number	1-6	1	509999	Outside range of permissible values	Card rejected
Year	7-8	0	99	Blank field	Card rejected
Month	9-10	1	12	Outside range of permissible values	Card rejected
Day	11-12	1	31	Outside range of permissible values	Card rejected
State of weather	13	0	9		None
Dry-bulb temp.	14-16	-99	136	Outside range of permissible values or blank field	Card rejected
Humid. variable	17-19			Outside range of permissible values or blank field	Card rejected
Wet-bulb (col. 61=1)		-99	Dry-bulb		
Rel. humid. (col. 61=2)		0	100		
Dewpoint (col. 61=3)		-99	Dry-bulb		
1-Hr. TLFM (Time Lag Fuel Moisture)	20-22				Unconditionally converted to blanks
Herb. veg. condition	23-24	0	99 ²	Outside range of permissible values	Converted to blanks
Man-caused risk	25-27	0	100	Outside range of permissible values	Converted to blanks
Wind direction	28	0	8	Outside range of permissible values	Converted to a blank
Wind speed	29-31	0	99	Outside range of permissible values	Converted to blanks
Woody veg. condition	32	5	9	Value other than 5, 7, or 9	Converted to blanks
10-Hr. TLFM	33-35	0	99	Value of -25 Value of -1 through -24 Outside range of permissible values	Converted to 025 (without notification) Converted to 001 through 024 Converted to blanks
100-Hr. TLFM	36-38				Unconditionally converted to blanks
24-Hr. max. temp.	39-41	Dry-bulb ³	136	Max.=min.=100 Outside range of permissible values	Both fields converted to blanks Converted to blanks
24-Hr. min. temp.	42-44	-99	Dry-bulb ³	Outside range of permissible values	Converted to blanks
24-Hr. max. rel. humid.	45-47	1	100	Max.=min.=100 Outside range of permissible values	Both fields converted to blanks Converted to blanks
24-Hr. min. rel. humid.	48-50	1	100	Outside range of permissible values Min.> max.	Converted to blanks Both fields converted to blanks
Precip. kind	51	0	9		None
Precip. duration	52-53	0	24	Negative value >24	Converted to its absolute value Converted to a blank
Precip. amount	54-57	0	999 ^	Col. 54=T Outside range of permissible values	Col. 55-57 converted to zeros Converted to blanks
Lightning activity level	58-60	1	5	Outside range of permissible values	Converted to blanks
Humid. variable indicator	61	1	3	Value other than 1, 2, or 3	Card rejected

¹Notification consists of printing the offending field along with a message stating the action taken.

²Some historic data contained codes -1, -2 and -3, which were retained during the edit, but all new entries must be within the specified limits.

³Due to slight differences in instruments, a variance of 5° from dry-bulb temperature for the limits on daily extreme temperatures is allowed.

NOTES.--Valid characters are the digits 0 through 9; - is allowed in certain fields; T is allowed in column 54. Invalid characters cause the field to be converted to blanks, with notification. Leading and embedded blanks are converted to zeros without notification. Unless otherwise specified, fields that are entirely blank remain unchanged.

newly acquired historical data. The data in the library are stored on several computer tapes in a sorted order by station number, then by date. Hence fire weather data are available to users from both the library and collection tapes, which contain all data of record and are current to within a month.

Forecasts (saved by request of the user) received from AFFIRMS are stored on a separate 'forecast' tape. Forecasts are collected for an entire year and then are sent to USFS regional data processing centers. No library of forecast data is maintained. At any time during the year, however, data on the forecast tape are available to users in exactly the same manner as data on the collection tape.

Retrieval of information stored on the library, collection, and forecast tapes is facilitated by a collection of routines called GETDATA available to all users on demand. These routines perform the functions of finding the information requested by the user, and transferring it to some storage device (tape, disk, or cards). These routines can retrieve large or small blocks of information such as all records for a given State, or a year's data for an individual station.

Data arriving at the Rocky Mountain Station are first screened and edited according to the criteria listed in table 1. In instances when a data record is rejected an effort is made to salvage it. Usual procedure is to send a list of the rejected data to the

originating agency and ask for corrections from the source documents. The corrected data records may then be returned to the Rocky Mountain Station and checked again. Checked data are sorted by station number and date, and merged onto the appropriate collection or forecast tape. At this time, data are checked for duplicate station-date entries. If duplicates occur in the incoming data only, the last of the duplicate records encountered will be saved and merged. If a duplicate station-date is found on the collection tape, the new record will replace the existing record. In both situations, messages are printed to inform the library manager of the action taken.

At the end of the calendar year, the collection tape is merged onto the library tapes. As with the collection tape, new or incoming records will replace existing records where duplications in station-dates are encountered. Erroneous data can be corrected in this manner. At this time, the lag in the recording of lightning activity level (Deeming et al. 1972) is removed, so that the lightning activity level applies to the date of the record, not the previous day. Otherwise the data are not altered.

As the volume of stored data increases, more tapes must be used and the redistribution of data over the old and new library tapes must be recognized. Hence, a short cross reference of station-years and file names is available, and should be accessed at least once a

year (around January 31) to verify the location of a particular State or station (an example follows in a later section).

How Can It Be Used?

A major effort has been made to construct a *useful* data retrieval system. Access to the Fire Weather Data Library is therefore provided by a series of routines entitled GETDATA. In the discussion that follows, we will be concerned with retrieval of data from the library stored on the U.S. Department of Agriculture UNIVAC 1108 computer at the FCCC. This library is actually a duplicate of the one maintained for research purposes on the Colorado State University CDC 6400 computer, thus assuring a modest level of protection against data loss.

The program file FIREDATALIB*PROGRAMS at FCCC contains the software to obtain the following kinds of information from the data library;

- I. A listing of file names and station-year limits.
- II. An inventory of the data on any given data tape.
- III. A file of selected data for analyses.
- IV. A list of card images.

Sample run streams with explanations follow.

I. Obtaining File Names

The following run will print a short table, including the station-year limits for each reel. Those limits are of the form SSSSSYY (SSSSS = station number, YY = year) and may represent an allowable range of data as opposed to an actual station-year appear-

ing in the library.

1. Obtain exclusive use of the program file.
2. Execute the absolute element which will produce the table.
3. Terminate the run.

```

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45
1. @ASG,AX FIREDATALIB*PROGRAMS.
2. @XQT FIREDATALIB*PROGRAMS.LISTFILES
3. @FIN

```

FILE	STATION-YEAR LIMITS		DATE OF LAST UPDATE
	FROM	THROUGH	
FIREDATALIB*00-04	00000000	04079999	062475
FIREDATALIB*04A	04080000	04510599	062475
FIREDATALIB*04B	04510600	04999999	070175
FIREDATALIB*05-09	05000000	09999999	061975
FIREDATALIB*10-20	10000000	20999999	062175
FIREDATALIB*21-26	21000000	26999999	062075
FIREDATALIB*27-41	27000000	41999999	062375
FIREDATALIB*42-47	42000000	47999999	070375
FIREDATALIB*48-50	48000000	50999999	070375
FIREDATALIB*NEWYR	00000000	99999999	101075
FIREDATALIB*FRCST	00000000	99999999	101075

NOTE - THE TIME LAG IN THE RECORDING OF THE LIGHTNING ACTIVITY LEVEL HAS BEEN REMOVED FROM THE DATA IN THE REGULAR LIBRARY, BUT IS STILL PRESENT IN THE NEW DATA BEING COLLECTED (NEWDAT). IT WILL BE REMOVED WHEN THAT DATA IS MERGED INTO THE REGULAR LIBRARY.

II. Obtaining a New Inventory

The cross-reference table produced in part I supplies the date of the last update to each tape. When desired, a new inventory may be printed by the following:

Note: The user who is familiar with the UNIVAC EXEC 8 features may wish to use list processors other than the EDITOR; or it may be desirable to use commands within the EDITOR other than PRINT! to obtain only certain portions of the inventory. The PRINT command will produce an average of 6 pages of inventory information.

1. Obtain exclusive use of the program file.
2. Enter the editor in READ mode. The element name must be supplied and it begins with INV followed by the file name.
3. Editor lists the entire element and displays the following:
 - a. station number
 - b. total number of records (a record represents one day's data)
 - c. years represented in the records
 - d. number of records for each year
4. Exit from editor.
5. Terminate the run.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45				
1.	@	A	S	G	,	A	X	F	I	R	E	D	A	T	A	L	I	B	*	P	R	O	G	R	A	M	S	.																					
2.	@	E	D	,	R		F	I	R	E	D	A	T	A	L	I	B	*	P	R	O	G	R	A	M	S	.	I	N	V	0	0	-	0	4														
3.	P	R	I	N	T	!																																											
4.	E	X	I	T																																													
5.	@	F	I	N																																													

INVENTORY OF FIRE WEATHER DATA TAPE 00-04 AS OF 06/24/75
PAGE 1 STATION-YEAR LIMITS 00000000 THROUGH 04079999

STATION	TOT REC	YR (N REC) . . .
000111	547	70 (201), 71 (176), 72 (170),
000486	1489	64 (152), 65 (122), 66 (142), 67 (184), 68 (173), 69 (184), 70 (174), 71 (181), 73 (177),
000582	1579	64 (184), 66 (173), 67 (184), 68 (184), 69 (183), 70 (184), 71 (183), 72 (166), 73 (138),
000583	1723	64 (170), 65 (184), 66 (184), 67 (184), 68 (184), 69 (184), 70 (174), 71 (179), 72 (111), 73 (169),
000961	243	73 (92), 74 (151),
001115	629	70 (188), 71 (183), 72 (182), 73 (76),
002201	30	66 (30),
003040	10	66 (10),
003201	198	73 (75), 74 (123),
009002	243	73 (92), 74 (151),
010701	2191	65 (365), 66 (365), 67 (365), 68 (366), 69 (365), 70 (365),
012701	2191	65 (365), 66 (365), 67 (365), 68 (366), 69 (365), 70 (365),
015902	1733	65 (279), 66 (364), 67 (364), 68 (366), 69 (360),
020101	914	65 (107), 66 (107), 67 (151), 69 (106), 70 (138), 71 (153), 72 (152),

⋮

III. Obtaining Data for Analysis

The data may be obtained as card images² or in the station-year blocking format. The card image format is simplest to use since the resulting file may be read by the normal formatted READ or it may be "added" to the input stream by the use of the @ADD,E command. One possible use of the second format, the station-year blocks, is to create a library tape for a particular area that crosses State boundaries. An example would be the Yellowstone area: Data from Wyoming, Idaho, and Montana may well be on three separate reels; by creating a tape containing only selected data, the user could still have the benefits of rapid access to any part of the data without accessing two or three tapes.

A. Data Card Format

col	contents
3-10	First Station-year
13-20	Last Station-year
25	Blank for card images; 1 for station-year blocks.

Sample data:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1.	0	4	0	3	0	7	7	4																
2.	0	4	5	1	0	5	6	1					0	4	5	1	0	5	7	0				
3.	0	4	5	6	1	1	0	0					0	4	5	6	1	1	9	9				
4.	0	5	0	1	0	1	0	0					0	5	6	0	0	2	9	9				1

- 1. Obtain card images for 1974 for 04030/.
- 2. Obtain card images for 1961 through 1970 for 045105.
- 3. Obtain card images for all years for 045611.
- 4. Obtain station-year blocks for all years, and for all stations in State 05. (Note that leading zeroes must be entered.)

Note: It will save processing time if the input cards (or entries from the terminal) are in ascending order.

B. Sample Run (see p. 6 top)

- 1. Obtain exclusive use of the program file.
- 2. Assign the first file from which data are to be extracted. If the files are needed, they will be dynamically assigned and freed during execution.
- 3. Assign a mass storage file to receive the card images and catalog it if the run terminates normally.

²Data format is set forth in Helfman et al. 1975 [p. G-1] and repeated in Appendix B.

- 4. Assign a blank tape to receive the station-year blocks.

*Note: Either or both of steps 3 and 4 may be assigned to scratch files.

- 5. Assign internal unit number of 2 to the library tape.
- 6. CARDS will be referenced as file 15.
- 7. BLØCKS will be referenced as file 16.
- 8. Execute the absolute element to select the data.
- 9. Data cards as described in part A.
- 10. End of data cards.
- 11. Terminate the run. The mass storage file CARDS and the magnetic tape BLØCKS are now available for use by analysis programs.

IV. Listing the Card Images

If the user suspects an error in the data, the year in question may be listed for proofreading by the following sequence (see p. 6 bottom):

- 1. Obtain exclusive use of the program file.
- 2. Assign the inventory tape which contains the year(s) to be listed.
- 3. Assign a mass storage file to receive the card images and catalog it unconditionally.
- 4. Assign a scratch file for the block images.
- 5. Execute the absolute element to select the data.
- 6. Data cards as described in Part III, A.
- 7. End of data cards.
- 8. Complete the cataloging of the file containing the card images.
- 9. Execute the absolute element to list the cards.
- 10. Add the card image file to the runstream to be listed.
- 11. Delete the cataloged file (if no longer needed).
- 12. Terminate the run.

Note: Steps 9 and 10, which perform the actual list, may be accomplished more economically by the @PRT,@ELT or @ED processors, if desired.

Summary

The Fire Weather Data Library has been compiled and made available at FCCC and Colorado State University for scientists and resource managers who need historic weather data to support their predictions and decisions. Most of the data are from stations in forested and/or mountainous areas not adequately covered by the National Weather Service. These data should therefore be useful in mountain and forest meteorology research.

The Data Library is accessible to all users of the USDA computer in Fort Collins, Colo. Auxiliary

III. Obtaining Data for Analysis

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45			
1.	@	A	S	G	,	A	X	F	I	R	E	D	A	T	A	L	I	B	*	P	R	O	G	R	A	M	S	.																				
2.	@	A	S	G	,	A		F	I	R	E	D	A	T	A	L	I	B	*	0	0	-	0	4	.																							
3.	@	A	S	G	,	C	P		C	A	R	D	S	.																																		
4.	@	A	S	G	,	T		B	L	O	C	K	S	.	,	U	9	V																														
5.	@	U	S	E		2	.	,	F	I	R	E	D	A	T	A	L	I	B	*	0	0	-	0	4	.																						
6.	@	U	S	E		1	5	.	,	C	A	R	D	S	.																																	
7.	@	U	S	E		1	6	.	,	B	L	O	C	K	S	.																																
8.	@	X	Q	T		F	I	R	E	D	A	T	A	L	I	B	*	P	R	O	G	R	A	M	S	.	G	E	T	D	A	T	A	2														
9.						0	4	0	2	0	5	7	4																																			
						0	4	0	4	0	4	0	0																																			
10.	@	E	O	F																																												
11.	@	F	I	N																																												

DATA SELECTION 11/04/75

FROM	TO	REEL	OUTPUT
04020574	04020574	00-04	FORMATTED CARD IMAGES, N = 165
04040400	04041099	00-04	FORMATTED CARD IMAGES, N = 3235

THERE ARE 3400 FORMATTED CARD IMAGES TOTAL ON THE FILE CREATED BY THIS SELECTION

IV. Listing the Card Images

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45			
1.	@	A	S	G	,	A	X	F	I	R	E	D	A	T	A	L	I	B	*	P	R	O	G	R	A	M	S	.																				
2.	@	A	S	G	,	A		F	I	R	E	D	A	T	A	L	I	B	*	0	0	-	0	4	.																							
3.	@	U	S	E		2	,	F	I	R	E	D	A	T	A	L	I	B	*	0	0	-	0	4	.																							
4.	@	A	S	G	,	U	P		1	5	.																																					
5.	@	X	Q	T		F	I	R	E	D	A	T	A	L	I	B	*	P	R	O	G	R	A	M	S	.	G	E	T	D	A	T	A	2														
6.						0	4	0	1	0	1	7	4																																			
						0	4	0	4	0	4	0	0																																			
7.	@	E	O	F																																												
8.	@	F	R	E		1	5	.																																								
9.	@	X	Q	T		F	I	R	E	D	A	T	A	L	I	B	*	P	R	O	G	R	A	M	S	.	A	B	S	L	I	S	T	C	A	R	D	S										
10.	@	A	D	D	,	E	P		1	5	.																																					
11.	@	D	E	L	E	T	E		1	5	.																																					
12.	@	F	I	N																																												

NUMBER	STATION	COUNTY	STATE AGENCY	PROTECTION UNIT	LAT	LONG	SEC	TWP	RNG	ELEV	FS
050101	HOUND TOP LO	MUFFAT	CA NPS	ONOSAUR NM	40.43	108.92	25	04N	103W	8575	02
050102	ARTESIA	MUFFAT	CO NPS	ONOSAUR NM	40.25	109.00	07	01N	103W	6000	02
050202	MORRISON CRK.	ROUTT	CO USFS	ROUTT NF	40.22	106.78	23	03N	84W	8400	02
050203	COLUMBINE	ROUTT	CO USFS	ROUTT NF	40.88	106.98	06	10N	85W	8500	02
050302	GOULD	JACKSON	CO USFS	ROUTT NF	40.53	106.03	04	04N	77W	8975	02
050402	GRAND LAKE RS	GRAND	CO NPS	ROCKY MT. NP	40.25	105.83	31	04N	75W	8576	02
050405	WINTER PARK	GRAND	CO USFS	ARAPAHO NF	39.88	105.77	10	02S	75W	9000	02
050505	RED FEATHER RS	LARIMER	CO USFS	ROOSEVELT NF	40.80	105.53	35	10N	73W	8200	02
050507	UTILITY AREA	LARIMER	CO NPS	ROCKY MT. NP	40.36	105.55	34	05N	73W	7800	02
051501	RIO BLANCO	GARFIELD	CO USFS	WHITE RVR NF	40.03	107.28	21	01N	88W	8800	02
051601	FULFORD	EAGLE	CO USFS	WHITE RVR NF	39.52	106.67	13	04S	83W	9800	02
051602	BASALT RS	EAGLE	CO USFS	WHITE RVR NF	39.38	107.01	08	08S	86W	6624	02
051603	MINTURN	EAGLE	CO USFS	WHITE RVR NF	39.57	106.40	36	05S	81W	7800	02
051701	OILLON RS	SUMMIT	CO USFS	ARAPAHO NF	39.62	106.05	17	05S	77W	9000	02
051801	BERTHOUD PASS	CLEAR CREEK	CO USFS	ARAPAHO NF	39.80	105.78	10	03S	75W	11314	02
051803	SQUAW MTN.	CLEAR CREEK	CO USFS	ARAPAHO NF	39.67	105.50	30	04S	72W	11475	02
051804	CORRAL CREEK	CLEAR CREEK	CO USFS	ARAPAHO NF	39.65	105.46	04	04S	72W	8100	02
051901	MT. THURGOOD	GILPIN	CO USFS	ROOSEVELT NF	39.88	105.47	11	02S	72W	10500	02
052001	INTERCANYON	JEFFERSON	CO CSFS	GOLDEN OIST.	39.57	105.22	34	05S	70W	7080	02
052401	COLORADO NM	MESA	CO NPS	COLORADO NM	39.10	108.70	13	11S	102W	5800	02
052405	CUPRIER	MESA	CO USFS	GM-UNCOM NF	39.25	107.73	02	09S	93W	8000	02
052408	GRAND JUNCTION	MESA	CO RLM								
052601	LEAVILLE RS	LAKE	CO USFS	SAN ISABEL NF	39.23	106.29	26	09S	80W	10200	02
052801	CRESTED BUTTE	GUNNISON	CO USFS	GUNNISON NF	38.97	106.99	03	14S	86W	9000	
052802	GUNNISON	GUNNISON	CO USFS	GUNNISON NF	38.53	107.03	02		91W	8000	

Figure 1.—Example of computer print-out available on fire weather stations.

programs are provided as part of the Library to aid the user in retrieving data. Software is also available to allow the user to obtain an inventory of any or all of the data tapes in the Library.

A problem that has not been adequately solved is how to provide station identification information to the users. At present, if a user wants geographical information about any of the stations in the Library, he must request the information from the authors. Figure 1 is an example of the information about each station that is available upon request.

Literature Cited

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- Furman, R. William, and Robert S. Helfman. 1973. A computer program for processing historic fire weather data for the national fire-danger rating system. USDA For. Serv. Res. Note RM-234, 12 p. Rocky Mt. For. and Range Exp. Stn., Fort Collins, Colo.
- Helfman, Robert S., John E. Deeming, Robert J. Straub, and R. William Furman. 1975. User's guide to AFFIRMS: Time-share computerized processing for fire danger rating. USDA For. Serv. Gen. Tech. Rep. RM-15, 107 p. Rocky Mt. For. and Range Exp. Stn., Fort Collins, Colo.

Appendix A States of the United States

Station numbers are always six digits: SSCCWW, where

SS represents the state number

CC represents the county number

WW represents the weather station number

- | | |
|-------------------|--------------------|
| 00. * | 24. Montana |
| 01. Alabama | 25. Nebraska |
| 50. Alaska | 26. Nevada |
| 02. Arizona | 27. New Hampshire |
| 03. Arkansas | 28. New Jersey |
| 04. California | 29. New Mexico |
| 05. Colorado | 30. New York |
| 06. Connecticut | 31. North Carolina |
| 07. Delaware | 32. North Dakota |
| 08. Florida | 33. Ohio |
| 09. Georgia | 34. Oklahoma |
| 49. Hawaii | 35. Oregon |
| 10. Idaho | 36. Pennsylvania |
| 11. Illinois | 37. Rhode Island |
| 12. Indiana | 38. South Carolina |
| 13. Iowa | 39. South Dakota |
| 14. Kansas | 40. Tennessee |
| 15. Kentucky | 41. Texas |
| 16. Louisiana | 42. Utah |
| 17. Maine | 43. Vermont |
| 18. Maryland | 44. Virginia |
| 19. Massachusetts | 45. Washington |
| 20. Michigan | 46. West Virginia |
| 21. Minnesota | 47. Wisconsin |
| 22. Mississippi | 48. Wyoming |
| 23. Missouri | |

*Used only for a few National Weather Service stations not in the current 6-digit number system.

Appendix B

The Format of AFFIRMS Archived Fire Weather Data

Punch Card Format (Modified) for WS Form D-9a

Field Description	Begin Col. #	End Col. #
Station Number	1	6
Year	7	8
Month	9	10
Day	11	12
State of Weather		13
Dry-Bulb Temp. (°F)	14	16
Relative Humidity (%)	17	19
*1-Hr-T/L Moist.	20	22
Herb-Veg-Cond (Model 1)	23	24
Man-Caused-Risk	25	27
Wind Direction (8 point)		28
Wind Speed (mph)	29	31
Woody-Veg-Cond (Model 1)		32
*10-Hr-T/L Moist. (%)	33	35
*100-Hr-T/L Moist. (%)	36	38
Max. Temp (°F)	39	41
Min. Temp (°F)	42	44
Max. R.H. (%)	45	47
Min. R.H. (%)	48	50
Not Used		51
Precip. Duration	52	53
Precip. Amount (in)	54	57
Lightning Act. Level	58	60
Digit "2"		61
Model 1 I.D.		62
Secondary Models:		
Model 2 I.D.		63
Model 2 Woody		64
Model 2 Herb	65	66
Model 3 I.D.		67
Model 3 Woody		68
Model 3 Herb	69	70
Model 4 I.D.		71
Model 4 Woody		72
Model 4 Herb	73	74
Model 5 I.D.		75
Model 5 Woody		76
Model 5 Herb	77	78
**Forecast Flag		79
Region Number		80

*See paragraph 6

**1 = Forecast; 0 or blank = Observation

Explanatory Notes for Modified WS D-9a Card Format

The card images are generated by the archiving processor of the "AFFIRMS" program. Some variations

from the normal Weather Service WS D-9a form have been introduced. They are described below:

1) Because all humidity entries are converted by "AFFIRMS" to relative humidity (even though the input may have been wet-bulb, dewpoint, or R.H.) only the relative humidity is available for archiving. The presence of the digit "2" in card column 61 indicates that the data in columns 17-19 are relative humidity and not wet-bulb (standard for the WS-D9a).

2) The "AFFIRMS" system permits up to 5 fuel models to be associated with any given station. A separate woody-vegetation-condition and herbaceous-vegetation-condition can be specified for each model. Because later use of this data may require these conditions (for example, if live fuels are involved), the card format has been modified to include the first model's values in the normal positions on the card (23-25 for herbaceous, 23 for woody condition). The model identifier (a letter from A through I) for the first model is then placed in column 62. The other four models have their identification herbaceous-condition, and woody-condition placed in columns 63 through 78. Subsequent processing of these card images should check for a blank Model I.D. in column 62 indicating no model specification.

3) In the Max/Min temperature and humidity fields, a value of 100 in both Max and Min indicates that *both* values were missing. Subsequent processing should make this check.

4) The Forest Service Region number (column 79-80) is included for convenience in sorting by the National Fire Danger Rating Library before distribution to regional ADP offices.

5) The wind direction 8-point code in the card images has been derived from the sorted degrees-of-the-compass value. Some stations may enter wind direction in systems other than 8 point which offer more resolution, such as 16 point or degrees-of-the-compass. Such additional resolution is, of course, lost when this conversion to 8 point is made. Missing direction is recorded in the card images as "0".

6) The 1-, 10-, and 100-hour timelag fuel moistures are only archived if actually entered (non-missing) in an observation. In all cases where these items are computed from ambient conditions, they appear in the archived records as zero or blank.

7) For the period 1973 through March 1975, "AFFIRMS" made only one consistency check on the precip. amount: values were required to be between 0 and 10.00 inches. Occasionally, field personnel would enter 9 when they should have entered .90 or .09. These three values are all valid as far as the AFFIRMS program is concerned, therefore large precipitation amounts should be viewed with suspicion for this period.

Furman, R. William, and Glen E. Brink.

1975. The national fire weather data library: What it is and how to use it. USDA For. Serv. Gen. Tech. Rep. RM-19, 8 p. Rocky Mt. For. and Range Exp. Stn., Fort Collins, Colo. 80521.

The National Fire Weather Data Library is a collection of daily weather observations from fire weather stations across the Nation. Current data are accumulated on collection tapes, then merged onto library tapes annually. Example run streams are given for using the library on the UNIVAC 1108 computer at the Fort Collins Computer Center.

Keyword: Fire weather

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